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Abstract

PURPOSE:To realize the epitaxial growth of a GaAs layer without generating defects, by interposing, on an Si substrate, a Ge/GaAs/Si distorted superlattice layer composed of two-atomic layers, and growing a GaAs thin layer at a low temperature.
CONSTITUTION:On an Si substrate 1, a superlattice layer is repeatedly subjected to epitaxial growth by a treating method capable of controlling the growth for every atomic layer. The superlattice layer is composed of a Si layer 4, a GaAs layer 3 on the layer 4, and a Ge layer 2 on the layer 3, each of which has even number of atomic layers. A Ge layer 5 whose number of atomic layer is larger than that of a Ge layer consituting the superlattice layer is subjected to epitaxial growth. A GaAs layer 6 with several tens of atomic layers is subjected to epitaxial growth at a first temperature. A GaAs layer 7 for element formation is subjected to epitaxial growth at a second temperature higher than the first temperature. Thereby enabling the epitaxial growth of a GaAs layer without generating defects.